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ABSTRACT

The planning and implementation of vocational training in Singapore (training primarily intended for school-leavers) is highly directed toward serving labor force development objectives. This paper explains the vocational training infrastructure (a national system, the conduct of which is vested in the Vocational and Industrial Training Board), how it contributes to meeting these objectives, and how it must continue to do so in the future. The paper concludes with observations about the growth of employer-based training, and how the voaional training system can and must support it. Topics covered include the following: scope of vocational training, development in the Singapore context, development of the vocational training system, the new economic strategy, the New Education System, new dimensions of labor force development, institutional training, part-time institutional continuing education and training, basic education for skills training, industry-based vocational training, skills development fund support for vocational training, national skills standards and public trade tests, and plans for the future. (KC)

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VOCATIONAL TRAINING IN THE DEVELOPMENT PROCESS

The Singapore Experience

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VOCATIONAL TRAINING IN THE DEVELOPMENT PROCESS

- The Singapore Experience

Object

1. The planning and conduct of vocational training in Singapore is highly directed towards serving manpower development objectives. This Paper explains the vocational training infrastructure, how it contributes to meeting these objectives and how it must continue to do so in the future. The Paper concludes with observations about the growth of the "second front", namely employer-based training, and how the vocational training system can and must support it.

Scope of Vocational Training

2. "Vocational training" in this Paper refers to institutionalised or formalised training of persons for employment at the skill level conducted on a national basis. It is primarily directed at school-leavers. It includes the preparatoiy training of such persons for employment so that they may progress in due course to work at the skill level. The participation of employed persons in institutional programmes of part-time continuing education and training comes within the meaning of vocational training. Formalised schemes of training by employers of school-leavers also come within the meaning of vocational training.

3. Vocational training may be distinguished from employer-based training. This refers to customised training to meet production, re-structuring and specific development needs, undertaken directly by employers as a part of their investment.

4. Vocational training and employer-based training constitute the twin strategies of skill-level manpower development. Because of its extensive resources and infrastructure, the vocational training system plays an important role in assisting, supporting and promoting training by employers.

5. The overall responsibility for the planning, development and conduct of vocational training as a national system is vested in the Vocational & Industrial Training Board (VITB), which is a statutory board established by the Vocational & Industrial Training Board Act, 1979. VITB comes under the purview of the Ministry of Education. The directions of vocational training are set by the Council on Professional and Technical Education (CPTE), which oversees the national manpower strategy and sets targets for post-school institutional education and training at all levels.

6. The Skills Development Fund (SDF), administered by the Economic Development Board (EDB) under the Ministry of Trade and Industry, is the agency concerned overall with promoting employer-based training and works closely with VITB in the common area of vocational skill development.

7. There are substantial numbers of private schools in Singapore offering vocational development, particularly in commercial studies, office skills and various service trades like hairdressing and dressmaking. The national system has expanded into many areas previously served only by these schools. The national vocational system, however, provides training in a wide range of needed skills, particularly modern engineering skills, which the private education industry cannot viably undertake. This Paper excludes consideration of that sector.

Development in the Singapore Context

8. Singapore achieved self-government in 1959 and independence in 1965. It has had to struggle for survival through uncertain early years to fulfil its fundamental social and economic aspirations. Today, after 26 years, it has achieved some success. Singapore is now said to be a "middle-developing" country, with an indigenous per capita GNP in 1984 of S$12,353. Barring down-turns and unforeseen setbacks Singapore hopes by the end of the decade to attain a standard of living comparable to that of Japan at the beginning of this decade. The progress so far has been possible because of the political stability and peace Singapore has enjoyed. But this growth has equally been because its development strategies have recognised the fundamental realities that govern its courses of action.

9. Singapore is a small country, precisely 620.2 Km2, with a population of 2,558,000 and no natural resources. Consequently,

it is dependent entirely upon the enterprise, industry, skills and adaptability of its people for its economic growth.

10. Relative to the needs of a full-fledged modern economy Singapore's workforce of 1,187,000 is small. As at 1984 approximately 10% were guest workers. With population increase down to 1.1 and the age distribution increasing upwards, the workforce will in fact shrink after the year 2,000. Singapore therefore faces a manpower constraint for economic growth.

11. Singapore has an open economy, encourages foreign and multi-national investment and is dependent on externally-orientated industries. Singapore must therefore compete successfully against world competition. As it moves into the upper league this will become increasingly difficult. Given its manpower constraint, it can only do so by raising productivity through education and training. Moving to high value-added production requires skills and adaptability. Developing each person to his or her highest potential is not just an end in itself, but the means as well of uplifting the country further economically. Under-development or wastage of human resources on the other hand will seriously setback development.

12. In the 1960s and 1970s Singapore built the physical, communications and institutional infrastructure of the economy. In the 1980's and beyond Singapore's task is to build a workforce that is educated, skilled, efficient and adaptable.

Development of the Vocational Training System

13. The need for vocational training as an avenue for employment was recognised early. A Commission of Inquiry into Vocational and Technical Education in Singapore was appointed in 1960. In its Report published in 1961, the Commission recommended, inter alia, the establishment of a 2-year secondary vocational education stream in schools for the poorer performers. The recommendation was implemented in 1964.

14. By the late 1960s, the industrialisation programme began to take off. The concern was to achieve full employment. A ministrial-level National Industrial Training Council (NITC) was formed in 1968 to address the immediate shortage of industrial skills that became apparent. A Technical Education Department (TED) was created within the Ministry of Education to implement the programmes. Extensive use was made of Colombo Plan, UN and other technical assistance. Apprenticeship and in-plant training were transferred from the Ministry of Labour to TED. In 1969 the industrial training system was born, replacing the secondary vocational education stream. In a feat not easily paralleled, 9 vocational institutes were created between 1969 and 1971, raising enrolment from a few hundreds to 3,000. The Council ceased in 1972 with completion of these developments.

15. In 1973, the Industrial Training Board (ITB) was established to take over responsibility for the further development of industrial training. The tripartite composition of the ITB and the extensive appointment of Trade Advisory Committees provided

the direct link with industry essential to the provision of relevant courses. By 1978 the ITB had expanded full-time enrolment to 9,000. It had rationalised and expanded apprenticeship and introduced the Junior Trainee Scheme. The certification systems, National Skill Standards and the Public Trade Test system were also developed in this period. ITB support for industry was direct. Where requirements were established by an industry facilities were created or allocated for trainees sponsored by employers as against open enrolment for institutional training.

16. By the mid-1970s Singapore had achieved full employment. Besides the shortage of industrial skills the economy began to face a second problem, an absolute manpower shortage for further growth. The focus shifted from employment creation to the most productive and efficient use of manpower. In vocational training the concern by the late 1970s became the upgrading to the next level of skill and expansion to new sectors, particularly business studies. The non-participation of school-leavers in vocational training became identified as "wastage". The Adult Education Board (AEB), established in 1960, found itself on the other hand increasingly involved in the provision of commercial courses as well as pre-vocational training for primary school-leavers to join courses of ITB. These factors, among others, led to the formation of the Vocational and Industrial Training Board (VITB) on 1 April 1979 by the merger of the then AEB and ITB, to bring together the enlarging dimensions of education and training and

to be the agency to spearhead the vocational training strategies for the 1980s.

New Economic Strategy

17. In 1979, as Singapore faced the 1980s, it re-defined its economic strategy. The essence was to move out of competition based on low wages, or the Low Wage Trap, by implementing a high-wage policy and inducing the economy to re-structure on to a technology-intensive basis. The object was to economise the use of scarce manpower. The key to the new economic policy lay, of course, in whether the workforce had or could acquire the necessary education, skills and adaptability to perform at the higher rates of productivity to support the re-structuring. Skilled manpower became an even more crucial need. Once again, the strategy centred on the infrastructure for human resource development. The Council on Professional & Technical Education was formed at this time. A comprehensive package of measures for vocational training of school-leavers and the upgrading/ re-training of workers was introduced.

New Education System

18. In any human resource strategy, the base is the education system. Earlier that year in Jan 79, a New Education System was introduced. Fundamentally bi-lingual, the New Education System provided for three streams in both primary and secondary school, to allow pupils to progress at a pace more suited to their abilities. Within a 6:4:2 framework slower primary pupils were

allowed up to 8 years to complete primary education, while secondary pupils could take up to 5 years to acquire the General Certificate in Education "Ordinary" Level (GCE "O") and a further 3 years for the GCE "Advanced" ("A") Level. A new lower secondary school leaving certificate, the GCE "Normal" ("N") was introduced. Differing emphasis was also placed on the learning of two languages according to the pupils' abilities. In manpower terms the effect of the New Education System was to enable each pupil to go as far as possible in school, and thereby achieve the best possible educational take off for training and employment. By reducing dropouts, the system was aimed at cutting educational wastage. A schematic statement of the New Education System is given in Annex A. The New Education System set the scenario for the planning and structuring of vocational, technical and higher education.

New Dimensions of Manpower Development

19. The further education and training of those leaving the school system or already in the workforce became the matter of most direct concern. The following, which became pervasive in policy and public discussion in the early 1980s, reflect the philosophy and approaches taken in Singapore:-

The School-leaver

19.1 After school a person must train before employment. An unskilled worker has no future in the world of tomorrow.

The Worker

19.2 A person must have education in order to acquire modern skills or to perform effectively in the modern work environment.

19.3 A worker must continuously upgrade and modernise skills and knowledge or be left behind.

The Vocational Infrastructure

19.4 For the greater majority of school-leavers not proceeding for higher or technical education, the vocational training system must provide the preparation for transition to the world of work.

19.5 Training must be relevant to the needs of the economy, and the infrastructure must provide for progression.

19.6 School-leavers must have full information so they can make the right choices.

The Employer

19.7 Employers must invest in training their workers, or they cannot re-structure, change to new products or survive in a high wage environment. They will not attract the best workers.

19.8 Employer-based training must be systematic, effective and on-going to achieve its effects.

19.9 Companies and industries with specialised skill requirements must establish their own training for no one else will do it for them.

The preceding underlay the planning and development of Singapore's manpower resources. They also constituted the "message" to the population, and especially the workers through the National Trades Union Congress, for without response there can be no development. The most significant feature was the clearer identification of the separate and complementary roles of formalised vocational training for school-leavers and employer-based training, and the equal importance of both to the overall development objectives.

Institutional Training

20. The task entrusted to VITB is provision of the optimal mix of pre-employment institutional training matching available school-leavers with the projected requirements for manpower. In fulfilment of this objective VITB has targetted to expand its full-time enrolment capacity from 10,000 in 1980 to 23,572 in 1987 in order to be able to offer places to the different categories of school-leavers within a revised and expanded framework of training programmes, see Annexes B and C. At that point VITB will be able to admit 15,900 school-leavers a year,

corresponding to 60% of all school-leavers not proceeding for higher and technical education.

21. The fulfilment of these training targets is not only a matter of building up capacity and staff (some 680 additional training staff are being recruited and trained) but also of attracting the school-leavers. Progression to vocational training is not compulsory and their response cannot be presumed. Therefore, to maximise their doing so, an Automatic Registration System has been implemented under which every primary school-leaver is (automatically) offered a place in common preparatory programmes in a vocational institute nearest his or her home. This system is supported by an intensive promotional campaign, including talks by VITB officers to every Primary 8 class, with AV backup. The results have exceeded expectation. In Jan 85, the achieved capture rate was 81%, a most encouraging start. For secondary school-leavers, two other school-based admission systems have been introduced. A Joint Admission Board system caters for GCE "O" school-leavers eligible to join the Junior Colleges and Pre-University Centres (for GCE "A" levels), the Polytechnics (for technician-level Diploma courses) and VITB's higher level skill courses (technician-level Diploma & Certificate courses). For the other secondary school-leavers, choice of course is offered through a School Registration System. VITB in addition conducts Public Intakes through open advertisement. In Jan 85 and Jul 85 the overall capture rate of secondary school-leavers was 25%. Capacity was the constraint, not subscription which was 1.5 overall.

22. The scope and relevance of training is crucial and the following reflect the changes under development, according to level:-

Level	Enrolment Capacity FY80	Enrolment Capacity 1987	Targetted School-Leavers
*Diploma	40	396	GCE "O"
Industrial Technician Certificate	1,630	2,480	GCE "O"
Certificate in Business Studies	690	2,040	GCE "O"
National Trade Certificate Grade 2	400	3,528	GCE "O" GCE "N"
Preliminary Certificate in Business Studies	510	2,040	GCE "O" GCE "N"
National Trade Certificate Grade 3	3,400	6,498	GCE "N"
Basic Skills Training	2,700	3,950	Primary 8 and lower secondary school-leavers
Pre-Vocational Training	-	2,560	Primary 8 Monolingual
Others	630	80	
Total	10,000	23,572	

(*In Singapore Diploma-level technician training is conducted at the polytechnics. VITB undertakes this level of training only in the Applied Arts) Arts)

Whereas in the 1970s, training was provided at the basic semi-skilled National Trade Certificate Grade 3 (NTC 3) level for pre-mature secondary school-leavers, in the 1980s the shift has been both upwards and downwards, to offer rational progression into vocational training for GCE and primary school-leavers respectively.

23. All levels of courses have been reviewed and upgraded. Some have been phased out or transferred to industry and some cut back, while several modern generation skills have been introduced and the others upgraded. In the choice of courses VITB takes into account the manpower projections of the Ministry of Trade & Industry, the availability of school-leavers, the industries and economic sectors targetted for growth, anticipated changes in technology and the preference of school-leavers. Basically the needs of economic growth are the overriding consideration. Training is structured in Module form to facilitate combinations, re-combinations and changes. VITB has just completed a massive Review of VITB Courses involving a survey of employers, unions and government agencies to finalise its development programme after 1987, and the Trade Advisory Committees are evaluating the findings.

24. Fees for full-time institutional training are nominal. The cost of training is 90% subsidised by Government Grant.

Part-time Institutional Continuing Education & Training

25. VITB conducts extensive part-time Continuing Education & Training (CET) for persons in the workforce offering two major programmes:-

25.1 Vocational Skills courses.

25.2 Academic Education courses.

CET is conducted in the evenings and at weekends. VITB does not develop capacity specially to cater for part-time courses. It uses its full-time institutional facilities and staff for the vocational programme and Ministry of Education schools and teachers for the academic programme. Efforts to attract persons from industry to conduct CET have so far met with limited success.

26. The part-time vocational programme comprises mainly the courses conducted full-time, offered in Modules. Nearly all the full-time skill courses are offered part-time. All part-time curricula were restructured recently removing the requirement that trainees be in relevant employment to facilitate those who need re-training. Many apprenticeship programmes prescribe attendance at part-time courses. Part-time trainees take the Public Trade Tests on completion of courses. The intake into part-time vocational courses in FY84 was 13,000.

27. The part-time academic programme is a continuation of the function of the former Adult Education Board and is offered at all secondary levels leading to the GCE "N", the GCE "O" and the

GCE "A". They are targetted at workers who need formal educational qualifications for higher job functions or to pursue higher education and training. The offer of "second chance education" by VITB emphasises the integration of education and training in the manpower development programme. The total intake into the academic education programme in FY84 was 45,000.

28. The cost of the part-time vocational and academic education programmes are subsidised by between 80% and 50%.

29 VITB offers a range of part-time non-subsidised short courses of a non-formal nature. In addition, VITB mounts many ad hoc or specially tailored programmes at the request of industry at cost. In a recent development employers may now sponsor employees to join individual Modules (1 term) of a full-time course under the Modular Skill Training (MOST) scheme, utilising available vacancies and paying full-time subsidised fees. The number of all employer-sponsored trainees during FY84 was 2,600.

Basic Education for Skills Training (BEST)

30. In a study commissioned by VITB in 1981 it was found that some 300,000 workers did not possess primary education, and therefore their potential for upgrading was limited. In a development strategy dependent on the capacity of the workforce to adapt and upgrade, this was a serious deficiency. The response was the Basic Education for Skills Training (BEST) Scheme. The BEST programme offers basic education in Mathematics and English

Language, each in 4 progressive Modules (1 to 4) and each Module lasting 6 months part-time. A worker who successfully completes Module 4 in both subjects qualifies to take up skills training or enrol in Secondary 1 of the CET programme.

31. BEST was pilot tested in Jan 83 and the Comprehensive Scheme was launched in Jan 84 targetted to enrol some 40,000 workers a year. A total of 40,958 workers were enrolled in 1984, and at year end there were 149 in-company centres, 73 centres run by the National Trades Union Congress or the People's Action Party, and 100 Ministry of Defence and 8 VITB centres.

32. The BEST programme is administered by VITB, which also awards the Certificate in Basic Education for successful completion of each Module.

Industry-Based Vocational Training

33. On-the-job initial training has always taken place and continues today in one form or another. Formalised employer-based training coming within the vocational training system is confined to Apprenticeship and the Junior Trainee Scheme. There is no legislation governing Apprenticeship in Singapore. It is voluntary. The advantage of registration is the assistance, support and supervision provided. The VITB Apprenticeship Scheme implemented since 1980 for instance provides for full-time Institutional Training (IT), Supervised Field Training (SFT) and Work Experience (WE) in various sandwich arrangements. Besides

the preceding there are a good number of VITB-Industry Apprenticeship Schemes. The Junior Trainee Scheme was instituted under the Employment of Children and Young Persons (Amendment) Regulations, 1977. It provides for primary school-leavers below 16 years of age to be employed and, preferably, receive training under supervision of VITB. JTS training schemes normally comprise a component of full-time training followed by work experience.

34. Since 1980, VITB has implemented a scheme to encourage companies and industries to establish Approved Training Centres. Where these meet the criteria set they are allowed to conduct training and assess/test their own trainees, who are awarded VITB certification. As at FY84 there were 22 such centres, with an enrolment capacity of 2,000. They included the Singapore Hotel Association Training & Education Centre (SHATEC) and the Textile & Garment Industry Training Centre, which VITB helped to set up and to which it transferred its former courses and staff. In the case of the hotel centre VITB made available its training institute on lease.

35. As part of its investment promotion effort, the Economic Development Board (EDB) in the 1970s established training centres jointly with multi-national companies to have the benefit of an immediate number of highly skilled persons available to offer to attract new high-technology industries. Four such Government-Industry Training Centres, as they are now called, operate fully

funded by the Government, with an enrolment of 1,800 offering advanced modern engineering skills. EDB trainees are awarded VITB certification like trainees in Approved Training Centres. The EDB has since developed a number of other institutes offering technician level programmes in sophisticated high-tech areas.

36. In Apr 84 the government established a Construction Industry Development Board, which assumed responsibility for, inter alia, the training of construction workers. VITB made available its construction trades vocational institute for development as the new board's Construction Industry Training Centre (CITC), with an enrolment capacity of 1,000.

37. Except for the CITC, the trainees of these centres including the EDB centres, are apprentices registered with VITB. VITB for its part is reducing intakes under the VITB Apprenticeship Scheme in favour of full-time training. Expectedly, a high proportion of registered apprentices now come from these centres, as seen from these figures:-

Apprentices and Junior Trainees as at Year End FY84

Approved Training Centres	1,277
EDB Training Centres	2,313
VITB Apprenticeship Scheme	977
Company Schemes	213
	4,780

38. There are currently only about 70 Junior Trainees, due to the phasing in of the New Education System. The JTS Scheme will be used again for those Pre-Vocational Training trainees in VITB who do not progress to skill training.

39. The preceding development in formal employer-based vocational training reflect the policy of moving job-specific training to the industry itself or the authority responsible for it. An interesting development in the Jan 85 School Registration exercise was the inclusion of the courses offered by the EDB centres and CITC in the choices made available to school-leavers.

40. Under the New Economic Policy the message to industry is clear: train or be left behind. Industry must produce the new skills required to support re-structuring. Industry must not only train effectively but, collectively, train in adequate numbers. Industry must train those entering the workforce with or without institutional training and the existing workers.

Skills Development Fund Support for Vocational Training

41. As part of the wage correction policy, the government introduced the Skills Development Fund (SDF) Levy in Oct 79. Every employer is required to contribute to the Fund 2-4% (revised from 2 to 4% in 1982 and down to 2% in 1985) of the wages of every employee earning less than S$750 per month. The Fund is administered by the Economic Development Board with a tripartite Advisory Council. It disburses grants to encourage employers to undertake

upgrading training of their employees. No constraint is placed on the number of applications either in relation to contribution by the employer or the industry. Each case is judged on its own merits. The grant varies from 30% to 70% including absentee payroll. Applications may be made to attend approved institutional courses or specialised overseas attachments. Grants may also be made to support consultancy for production re-design with related training, and may be requested for training irrespective of level, i.e. from top management down.

42. The SDF places highest priority on the development of in-company or industry centres, and is prepared to make grants of up to 90% for the capital costs, plus other assistance for curriculum development and trainer training, in addition to supporting recurrent expenditure.

43. The SDF works closely with VITB in promoting vocational skill level training. The SDF awards grants to employers to sponsor employees for VITB's skill courses and apprentices. The SDF fully finances the BEST programme, which is administered by the VITB. SDF particularly supports the establishment and operation of those in-company and industry training centres granted Approved Training Centre status by VITB.

National Skills Standards and Public Trade Tests

44. VITB is the national authority responsible for the establishment of standards for skilled occupations. These are set by a

Certification Committee which includes representation from, inter alia, the Public Service Commission and licensing authorities. The National Skills Standards are published to serve as the guide to the development of training and as the standards to which the Board will test for award of certification.

45. VITB conducts Public Trade Tests for part-time trainees, apprentices and workers to grade and certify their skill attainment. The Board currently offers trade tests in a total of 37 trades.

Looking Ahead

46. Two questions arise at the end: What is the impact of the national Vocational Training system on manpower development? What are the further concerns and developments in the next phase?

47. The impact of the vocational training system is to be measured by its capability after 1987, as the immediate foregoing period has been a transitional one. In the late 1980s and early 1990s VITB will be able to offer some 15,900 places a year, and hopefully with near corresponding ouput. Subject to response this intake will represent 60% of all school-leavers not proceeding for further or technical education. If the apprenticeship intake capacities of the EDB and other centres are included this rises to 70%. In the category of primary school-leavers, VITB will in fact be able to accommodate up to 100%. Therefore, in the 1990s,

the greater majority of these school-leavers can receive vocational preparation before employment. Allowing for the fact that there will be a non-subscription factor, almost everyone who wants a place can be enrolled in economically relevant training, provided he or she is not fussy about choices. Considering the manpower needs to be faced, this will be an indispensible pre-requisite for employment.

48. Responding to change will be the biggest problem in the years ahead, especially as vocational training has moved into high-tech trades. Notwithstanding that training is designed to be broad-based to enable adaptability in employment, VITB's training is skill-specific. Besides identifying change quickly enough, modern engineering trade training facilities are most expensive to set up, and take time. Incorrect planning decisions can be disastrous. Where new curriculum and the recruitment and training of staff are involved the costs and complexities can double.

49. With the high level of investment and recurrent especially trainer costs involved the efficacy of instructional delivery becomes critical to the productivity of the whole training process. Well defined curriculum, purpose-made audio-visual packages and even the design and equipping of the learning environments need to be carefully addressed. Developing the expertise to do so and implementing changes fast enough are problems in themselves.

50. Given correct planning decisions and effective delivery, there is still the trainee to be concerned with. Attrition in vocational training tends to be universally high. The attrition rate in FY84 was 14.6%, but can rise to above 25% for individual "unpopular" courses offered to applicants as their second or third choice. The retention of the influx of primary school-leavers in future will be a special problem. The introduction of guidance and counselling services will be one of the measures to address this need. Combined with attrition is non-subscription, especially in Singapore's normally tight labour market conditions which lure school-leavers with attractive immediate gains. These two factors have a major effect on capacity utilisation, performance and output, and in the end on the manpower development objectives. The promotional and retention roles of VITB will be vital aspects in the efficiency of the vocational training process.

51. In the area of part-time skills training, the efforts will be directed at maximising the offer of the full-time places in the evenings. Currently about 35% is mobilised for part-time. The principal constraint is availability of trainers. VITB will in the years ahead need to successfully involve people from the workforce to respond to the need. The BEST programme must reach the majority of the older workers in need of basic education. The target is to reach at least 80% of them in the larger companies with in-house BEST facilities, with up to 40% completing both Modules 4.

52. The biggest developments ahead will take place in the area of employer-based training. VITB's role in supporting this sector, besides their formalised schemes of training and helping them establish training centres, will be increasingly in making its professional expertise and accumulated resources of training software easily accessible to employers. Now that the backlog of VITB's training for its requirements is near ending, the Centre of Vocational Training (CVT) will progressively move into the training of industry-based trainers. The publication of Skill Standards and the conduct of Public Trade Tests will continue to be important components of the total skilled manpower development infrastructure. While high wages will provide the pressure and SDF the funding, VITB must make available to employers the resources holdings of the national system. Where employers need to send their employees for institutional or formalised training, maximum access must be given to enable them to do so.

53. Finally, it is necessary to see the picture in overall terms. The development of the vocational training system since the 1960s was the "first front" of manpower development, and vocational training will continue to play a vital role. The launching of employer-based training through SDF from 1979 has been the opening of the "second front". The objective is to see an extensive, comprehensive and permanent Employer-Based Training infrastructure in place as part of the manpower development strategy, along-side the school system, the vocational system and the higher institutions. Only such an infrastructure can give

employers as a whole that quick response they need to new demand, new products and new technologies to stay one step ahead. With Singapore competing in the high-tech arena, this capability can only be created within industry itself.

54. The approaches to achieving this necessarily differ from industry to industry, according to size of companies and readiness to train. The process includes creating "think training" as part of production investment, starting in-house facilities, developing on-going and systematic training, and finally developing of corporate training policies. Employer-based training, besides the ability to plan, requires facilities, trainers, curriculum and instructional software which have to be put in place. While large companies have the potential to develop these, medium and small companies may not. One approach has been to motivate industry associations to set up joint training centres for their member companies. The SDF has been able recently to get 10 associations to do so by a total grant commitment of S$7m.

55. The level of employer-based training is already considerable. In the last few years the number of SDF commitments to support training has averaged the equivalent of 6% of the workforce. As against SDF levy collections of S$109m in 1984, commitments in the form of training grants amounted to S$63m. To that the employer's contribution has to be added, broadly in equal amount. This more than compares with VITB's budget in FY85 of S$86m. A level of employer-based training amounting to 10% of the

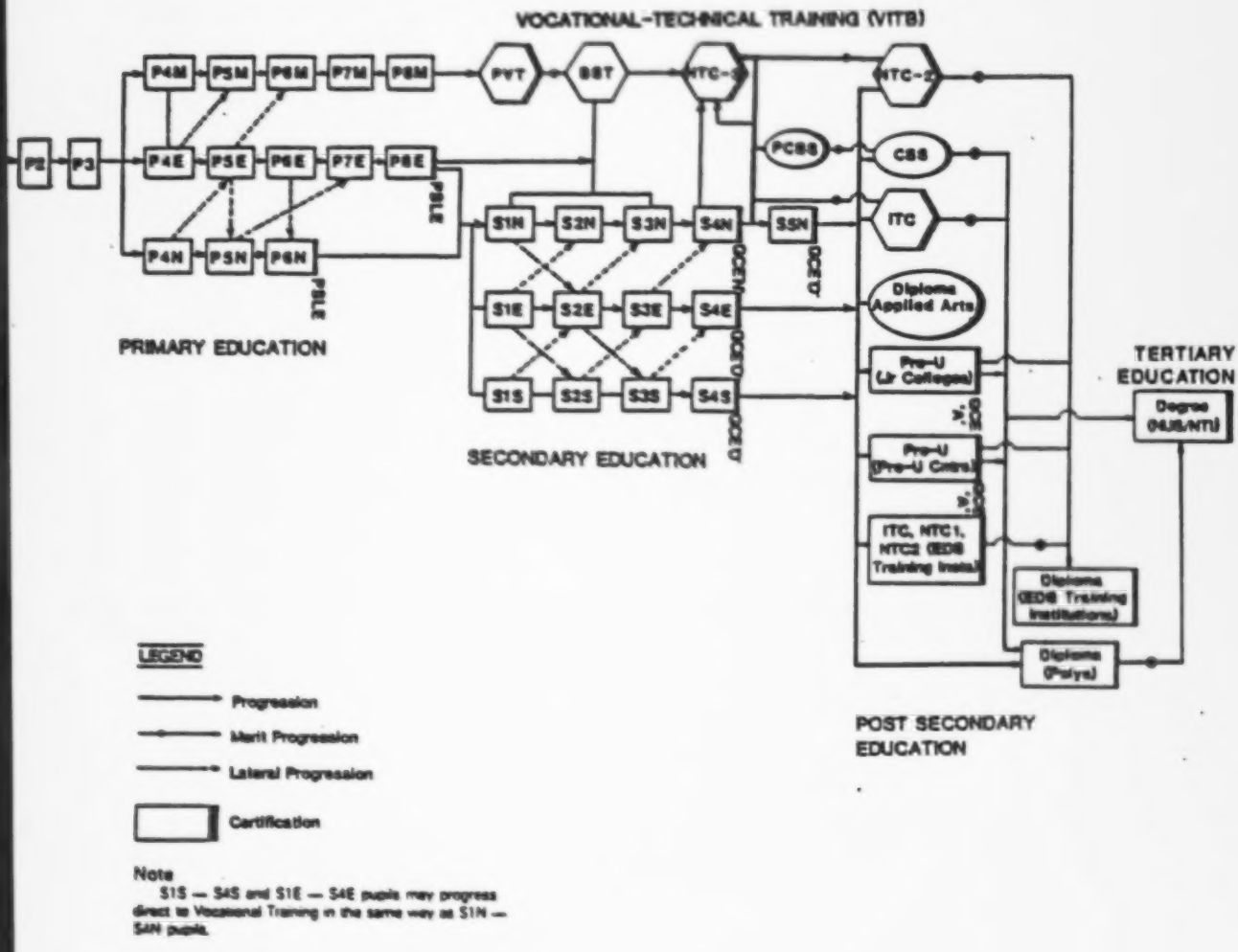
workforce annually is an objective that looks modest and reasonable in the immediate years ahead and is likely to be realisable. Although these figures refer to all levels and durations of training, they indicate the scale of the employer-based training function. The number of persons in employer-based training at the skill level is quite likely to, and in fact should, exceed that in full-time institutional training. With the accelerated pace of technological development it must grow. On the other hand, the number of school-leavers to be trained will drop, but their preparation will undoubtedly become extended. Far from suggesting any decline in the importance of vocational training the growth of the "second front" makes the preparation of school-leavers and its functions of support for employer-based training all the more vital. The functions of vocational training, continuing education and training and employer-based training will and must be the means to successfully attack the skilled manpower problem in the years ahead. What we hope to achieve is the workforce in "dynamic adjustment to change". Only in this way can we hope to attain levels of productivity necessary to support long term growth.

56. Since late 1984, Singapore has faced an economic downturn. This downturn has been a a telling reminder of Singapore's vulnerability to world demand and international competition. It has underscored the importance of having an educated and trainee workforce, able to change and respond quickly. The next few years will put our recent efforts to the test.

57. Development strategies must themselves be subject to review in response to changing conditions of competition. At this very time a ministerial-level National Economic Committee is re-appraising Singapore's total strategy. The recommendations of this Committee will have far-reaching effects in further determining the exact shape and thrust of vocational training and employer-based training in the 1990s.

- End -

STRUCTURE OF ACADEMIC-VOCATIONAL-TECHNICAL EDUCATION SYSTEM IN SINGAPORE



LEGEND

- Progression
- Merit Progression
- Lateral Progression
- Certification

Note

S1S — S4S and S1E — S4E pupils may progress direct to Vocational Training in the same way as S1N — S4N pupils.

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Abbreviations

New Education System

P	=	Primary
PN	=	Primary Normal
PE	=	Primary Extended
PM	=	Primary Monolingual
PSLE	=	Primary School Leaving Examination
SS	=	Secondary Special
SE	=	Secondary Express
SN	=	Secondary Normal
GCE	=	General Certificate of Education
GCE 'N'	=	GCE Normal level
GCE 'O'	=	GCE Ordinary level
GCE 'A'	=	GCE Advanced level

Vocational & Technical Training System

Dip in AA	=	Diploma in Applied Arts
ITC	=	Industrial Technician Certificate
CBS	=	Certificate in Business Studies
PCBS	=	Preliminary Certificate in Business Studies
NTC	=	National Trade Certificate
BST	=	Basic Skills Training
PVT	=	Pre-Vocational Training

Post-Secondary & Tertiary Education

Pre-U	-	Pre-University (GCE 'A')
EDB	-	Economic Development Board Centres/Institutes
Polys	-	Singapore Polytechnic and Ngee Ann Polytechnic
NTI	-	Nanyang Technological Institute
NUS	-	National University Singapore

LEVELS OF COURSES OFFERED BY VITB

Level	Duration/Entry Qualifications
Diploma in Applied Arts	Three-year programmes for GCE 'O'* level entrants.
Industrial Technician Certificate (ITC)	Two-year programmes for GCE 'O' and GCE 'N'+ level entrants.
Certificate in Business Studies (CBS)	Two-year programmes for GCE 'O' and GCE 'N' level entrants.
National Trade Certificate Grade 2 (NTC-2)	Two-year programmes for GCE 'O' and GCE 'N' level entrants.
Preliminary Certificate in Business Studies (PCBS)	One-year programme for GCE 'O' and GCE 'N' level entrants.
National Trade Certificate Grade 3 (NTC-3)	One-year programmes for entrants with Secondary 4 Normal. Two-year programmes of which Basic Skills Training (BST) forms the first year for Primary 8 Extended (P8E) and Secondary 1 to 3 entrants.
Certificate in Competency (CoC)	Short Artisan-level courses normally extending over three months for entrants with primary education.
Pre-Vocational Training (PVT)	One-year programme for Primary 8 Monolingual (P8M) pupils.

* General Certificate of Education "Ordinary" level.
\+ General Certificate of Education "Normal" level.

Progression

1. ITC & CBS holders with the Certificate of Merit (COM) are eligible for progression to the diploma courses of the Polytechnics.

2. PCBS holders with the COM are eligible for progression to the CBS.

3. NTC-3 holders with the COM are eligible for progression to the NTC-2 full-time courses. (The others have to do so via apprenticeship and part-time courses).

4. PVT holders who meet the minimum laid down requirements may progress to NTC-3.

COURSES OFFERED BY VITB

Diploma

1. Graphic Design
2. Interior Design

ITC

3. Electrical Engineering
4. Electronics Engineering
5. Mechanical & Electrical Drafting & Design
6. Mechanical Engineering

NTC-2

7. Air-Conditioning & Refrigeration Mechanics
8. Arc Welding
9. Architectural Drafting
10. Civil/Structural Drafting
11. Electrical Drafting
12. Electrical Fitting & Installation
13. Electrical Power & Machines
14. Electro-Mechanical Servicing
15. *Electronics Instrumentation
16. Electronics Servicing (Digital)
17. Electronics Servicing (Video)
18. Heavy Duty Diesel Mechanics
19. Maintenance Fitting
20. Mechanical Drafting
21. Motor Vehicle Mechanics
22. Offset Printing
23. Precision Machining
24. Tool & Die Making (Injection Mould)
25. Tool & Die Making (Press Tool)

NTC-3

26. Air-conditioning & Refrigeration Mechanics
27. Building Drafting
28. Building Services
29. Drassmaking
30. Electrical Fitting & Installation
31. Electronics Servicing
32. Furniture Production
33. Graphic Reproduction
34. Hairdressing
35. Heavy Duty Diesel Mechanics
36. Maintenance Fitting
37. Marine Fitting
38. Men's Tailoring
39. Metal Fabrication
40. Metal Machining
41. Motor Vehicle Mechanics
42. Offset Printing
43. Upholstery

CBS

44. Accounting
45. Secretarial Practice

PCBS

46. Preliminary Certificate in Business Studies

CoC

47. Binding & Finishing
48. Electrical Wiring
49. Woodworking Machine Operation

PVT

50. Pre-Vocational Training

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* To be introduced in 1987